Coronary Artery Fistulas Between Coronary and Pulmonary Arteries: Case Reports

Koroner ile Pulmoner Arterler Arasında Koroner Arter Fistülleri: Vaka Sunumları

Coronary to Pulmonary Fistula

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Özet

Konjenital koroner arter fistülü bir koroner arter ile diğer vasküler yapılar arasında direkt bağlantının olduğu nadir, izole bir anomalidir. Biz biri perkütan koil embolizasyon uygulaması ile, diğeri cerrahi olarak tedavi edilmiş iki konjenital koroner arteriyovenöz fistüllü vakayı sunduk.

Anahtar Kelimeler

Koil Embolizasyon; Anjina Pektoris; Koroner Arter Fistülü

Abstract

Congenital coronary artery fistula is a rare, isolated anomaly that is defined as a direct communication between a coronary artery and another vascular structure. We report on two cases of congenital coronary arteriovenous fistulas, one treated by coil embolization and the other with surgery.

Keywords

Coil Embolization; Angina Pectoris; Coronary Artery Fistula

DOI: 10.4328/JCAM.3346 Received: 26.02.2015 Accepted: 17.03.2015 Printed: 01.01.2016 J Clin Anal Med 2016;7(1): 123-5
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Introduction

Coronary artery fistula (CAF) are mostly abnormal congenital connections between a coronary artery and a cardiac or major intrathoracic vessel [1]. Coronary artery fistulas are rare with a 0.2% to 0.6% incidence in angiographic series. The patients with CAF are usually asymptomatic [2]. The most common findings are heart failure secondary to volume overload resulting from left to right shunting, ischemia secondary to coronary steal, arrhythmia, fistula rupture or thrombosis, and infective endocarditis [3].

Case Report 1

A 65-year-old female patient presented with exertional dyspnea and Canadian Cardiovascular Society (CCS) Class II chest pain. Her functional capacity was Class II according to New York Heart Association (NYHA). She stated that the dispnea was present for the last 10 months. She had several coronary risk factors including age over 60, and hypertension. Blood pressure was measured 160/80 mmHg on physical examination. Chest x-ray was normal and her electrocardiogram was in sinus rhythm and there were no other pathological features. Diastolic dysfunction was detected in the transthoracic echocardiography. Exercise stress echo test showed reversible antero-septal ischemia. Cardiac catheterization did not show any atherosclerotic disease but was remarkable for a large CAF originating from the mid-left anterior descending artery to the pulmonary artery (Figure 1). In view of the abnormal stress test showing anterior ischemia, we suspected coronary steal. Pulmonary artery pressure was 39/14 mmHg and Qp/Qs ratio was 1.3 during the cardiac catheterization, indicating significant left to right shunt. The patient was referred to cardiovascular surgery and surgical disclosure of the fistula was performed. Total hospital stay after the procedure was only ten days. After the 1-month follow-up visit, the patient was in good clinical condition.

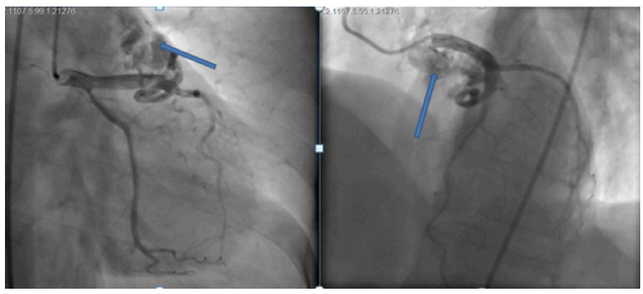

Figure 1. Selective angiography of left anterior descending artery-to-main pulmonary artery fistula (blue arrow).

Case Report 2

A 40-year-old woman was admitted to our hospital for coronary angiography with the complaint of CCS Class II chest pain and exertional dyspnea for 10 months. She was a nonsmoker and had none of the classical cardiac risk factors or a positive family history for coronary artery disease (CAD). On admission, her functional capacity was NYHA Class II-III. On physical examination, no abnormalities were found except for a 3/6 systolic murmur at the apex. Her electrocardiogram showed normal sinus rhythm. Laboratory findings were within normal limits including pro-Brain Natriuretic Peptide (pro-BNP 120 pg/mL) and chest radiography revealed cardiomegaly. Transthoracic echocardiography showed abnormal left ventricular size (left ventricular diastolic diameter= 58mm, left ventricular systolic diameter= 42mm) and function (left ventricular ejection function, LVEF 35%) without regional wall motion abnormalities, mild left atrial enlargement with mild mitral insufficiency. Given the clinical suspicion of CAD, she underwent cardiac catheterization, which revealed no obvious obliterative lesion in the coronary arteries. However, selective coronary angiography showed a large CAF, originating from the proximal right coronary artery (RCA) and draining into the right pulmonary artery (Figure 2). Embolization was performed with standard coils (Micro Vention Inc., Tustin, CA, USA). A 6F MAC 3.5 guiding catheter (Medtronic, Santa Rosa, CA, USA) was placed on the right coronary artery ostium using the antegrade approach method and the fistula vessel with origin and drainage was shown in the coronary angiogram. A standard 180 cm-long guidewire, Fielder (Asahi Intec, Aichi, Japan) for coils, was introduced into the fistula. To obtain complete occlusion, 3 coils (all 3 mm in diameter) were implanted so as to merge together forming a conglomeration (Figure 2). They were placed sufficiently distant from the drainage opening to prevent migration into the right pulmonary artery. The procedure was terminated without any complications. The patient was asymptomatic and her functional capacity improved significantly at the second-month follow-up.

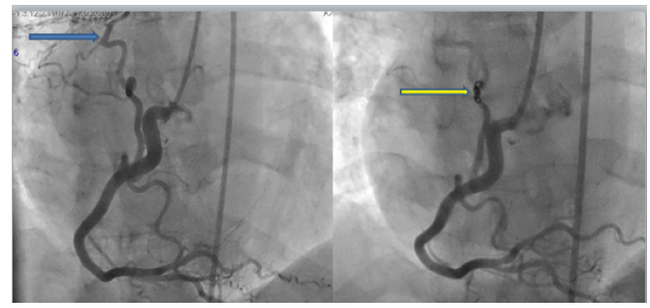

Figure 2. Selective angiography of the right coronary artery showed one fistula (blue arrow) and complete fistula was embolized by 3 coils (yellow arrow).

Discussion

Coronary arterial fistula, usually noticed incidentally on diagnostic cardiac catheterization in adult population, is an unusual congenital or acquired connection anomaly between one or more of the coronary arteries and cardiac chamber or great vessels [4,5]. Coronary artery fistula may be isolated in some cases (55-80%), or it may be associated with other cardiac anomalies (20-45%) such as tetralogy of Fallot, atrial septal defect, patent ductus arteriosus, and ventricular septal defect [6]. Coronary arterial fistulas are usually asymptomatic in the first decade, especially when they are hemodynamically small. Actually, a small number of cases may close spontaneously. After the first decade, the frequency of both symptoms and complications increases. Complications include 'steal' from the adjacent myocardium causing myocardial ischemia, thrombosis, embolism, cardiac failure, atrial fibrillation, rupture, endocarditis/endarteritis and arrhythmias [1]. Clinical symptoms such as exertional angina or dyspnea are the primary indications for closure of a fistula. The treatment of asymptomatic lesions is controversial, with some authors recommending early surgical intervention while others recommend a more conservative ap-

proach. A symptomatic CAF can be treated by percutaneous transcatheter occlusion or suture obliteration [7]. The choice of treatment method depends on the anatomy and morphologic features of the fistula. Surgical closure can be done on a beating heart or on cardiopulmonary bypass (CPB) especially when it represents the termination of coronary artery branch. Surgical treatment results in a low mortality rate from 0 to 4% and morbidity from 10% to 15% [8]. Percutaneous coil embolization is choice of treatment because of the cost effectiveness and less risk compared to surgery and is a serious alternative to surgical treatment [6]. In summary, CAF showing in late adult life are even more unusual and those should always be considered in the differential diagnosis of patients with coronary artery disease.

Competing interests

The authors declare that they have no competing interests.

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How to cite this article:
Karaağaç K, Keçeoğlu S, Demir M, Melek M, Ari H. Coronary Artery Fistulas Between Coronary and Pulmonary Arteries: Case Reports. J Clin Anal Med 2016;7(1): 123-5.